

Appl. No. 10/664,585
Amdt. Dated January 17, 2006
Reply to Office Action of October 17, 2005

Attorney Docket No. 81751.0066
Customer No.: 26021

REMARKS

This application has been carefully reviewed in light of the Final Office Action dated October 17, 2005. Claims 1, 5-7, 9-11 and 21 remain in this application. Claims 1 and 21 are the independent claims. Claims 1 and 21 have been amended. It is believed that no new matter is involved in the amendments or arguments presented herein. Reconsideration and entrance of the amendment in the application are respectfully requested.

Interview Summary

Applicant thanks the Examiner for the courtesies extended during the telephone interviews of November 30, 2003. Applicant has amended the claims as discussed during the telephone interviews, and, as also discussed during the telephone interview, submits that those claims are now in condition for allowance. Applicant incorporates the points made during that telephone interview herein.

Art-Based Rejections

Claims 1, 5-7, 10-11 and 21 were rejected under 35 USC §103(a) over USPN 6,169,323 (Sakamoto) in view of USPN 6,166,446 (Masaki); Claim 9 was rejected under 35 USC §103(a) over Sakamoto in view of Masaki and further in view of USPN 6,143,981 (Glenn). Applicant respectfully traverses these rejections and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Sakamoto Reference

Sakamoto is directed to a semiconductor device packaged in a plastic package having leads horizontally extending along the bottom surface of the plastic package.

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According to Sakamoto, the surface area for soldering is increased by making the end surface of a lead non-flat, uneven, pulsating, or saw-tooth shaped. (*See, Sakamoto, Col. 1, line 66 to Col. 2, line 21*).

The Masaki Reference

Masaki is directed to a resin-sealed type semiconductor device having a semiconductor element and electrodes. A radiator facilitates divergence of heat from the semiconductor element. A lead includes an inner lead portion and an outer lead portion. A resin portion seals and embeds the semiconductor element. (*See, Masaki, Col. 1, lines 56-67*).

The Glenn Reference

Glenn is directed to plastic packages for housing an integrated circuit die and lead frames. According to Glenn, the package provides a rectangular metal lead frame with a substantially planar die pad positioned with and connected to the frame. A plurality of finger-like rectangular tabs extend from the frame toward the die pad without contacting the die pad. The die pad and tabs have peripheral side surfaces which include a reentrant portion(s) and asperities that enhance the connection of the die pad and tabs to the plastic encapsulating material. (*See, Glenn, Col. 1, line 57 to Col. 2, line 8*).

The Claims are Patentable Over the Cited References

The present invention is generally related to a semiconductor package technology including manufacture of a semiconductor device.

As defined by independent Claim 1, as amended, a semiconductor device includes a die pad, a semiconductor chip having an electrode and bonded to the die

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pad, and an inner lead having a sloping section sloping upward and outward from the semiconductor chip. A surface of the die pad which the semiconductor chip is bonded faces upward. A wire electrically connects the inner lead to the electrode. A sealing section seals the inner lead, the semiconductor chip, and the wire. An outer lead extends outward from the sealing section. A portion of the inner lead is higher than the semiconductor chip.

The applied references do not disclose or suggest the above features of the present invention as defined by amended independent Claim 1. In particular, the applied references do not disclose or suggest, "an inner lead having a sloping section sloping upward and outward from the semiconductor chip," as required by the claims of the present invention. Moreover, the applied references do not disclose or suggest, "wherein a portion of the inner lead is higher than the semiconductor chip," as required by the claims of present invention.

Sakamoto is directed to a semiconductor device packaged in a plastic package having leads horizontally extending along the bottom surface of the plastic package. (*See, Sakamoto, Col. 1, line 66 to Col. 2, line 2*). As shown in Fig. 2-5, Sakamoto discloses leads (4) having a sloping section that slopes in a downward and outward direction from the semiconductor chip (2). Accordingly, Sakamoto does not teach or suggest a sloping section that slopes in a upward and outward direction from the semiconductor chip, as required by amended independent Claim 1.

Moreover, Sakamoto does not teach or suggest that a portion of the inner lead be higher than the semiconductor chip, as required by amended independent Claim 1. Sakamoto thus does not teach or suggest the above features of that claim.

The ancillary Masaki and Glenn references are not seen to remedy the above deficiencies of Sakamoto. For example, Masaki and Glenn are silent regarding a portion of the inner lead that is higher than the semiconductor chip.

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Since the applied references fail to disclose, teach or suggest the above features recited in amended independent Claim 1, these references cannot be said to anticipate or render obvious the invention which is the subject matter of that claim.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Applicant respectfully submits that amended independent Claim 21 is allowable for the least the same reasons as those discussed in connection with amended independent Claim 1.

The remaining claims depend either directly or indirectly from amended independent Claim 1, and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance.

Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6809 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

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